

REMARKS

The indication of allowable subject matter in claim 5 is acknowledged and appreciated. Accordingly, claim 5 has been rewritten into independent form. In addition, new independent claim 15 includes the features of claim 6 and what is believed to be the allowable subject matter of claim 5. In view of the following remarks, it is submitted that all claims are in condition for allowance.

Claim 14 stands rejected under 35 U.S.C. § 112, second paragraph. It is respectfully submitted that claim 14, as amended, is definite. Accordingly, it is respectfully requested that this rejection be withdrawn.

Claims 1, 6, 7, 9, 10, 12 and 13 stand rejected under 35 U.S.C. § 103 as being unpatentable over Neutzler '624 ("Neutzler") in view of Hwang et al. '228 ("Hwang"). This rejection is respectfully traversed for the following reasons.

The Examiner admits that Neutzler does not disclose a diffusion/intermediate layer between the alleged metal plate 91 or 92 and conductive film 94 or 96, respectively. The Examiner therefore relies on the teachings of Hwang to modify Neutzler to create such a diffusion/intermediate layer in an attempt to reach the claimed invention. However, it is submitted that Hwang is directed to a different type of anti-corrosion problem in an environment (e.g., high temperature carbonate) that is not relevant to Neutzler. For example, the corresponding "conductive film" of Hwang is an *aluminum* layer 53 formed on a nickel layer 52 which is in turn coated on a stainless steel plate 50. As such, Hwang uses an oxidative-*susceptible* "conductive film" to form the alleged diffusion/intermediate

layer whereas Neutzler expressly discloses an oxidative-*resistant* “conductive film” 94,96 (see col. 5, lines 28-30 of Neutzler).

Accordingly, Neutzler’s device already has an anti-corrosive film 94,96 for the separator and has *no disclosed need or desire for an additional diffusion/intermediate layer*. Hwang, on the other hand, relies *exclusively* on the diffusion/intermediate layer to provide the anti-corrosive property to the separator. Therefore, both Hwang and Neutzler, alone or in combination, suggest only a *single* anti-corrosive film. Nonetheless, it is respectfully submitted that the proposed combination is based solely on improper hindsight reasoning, whereby the Examiner selected bits and pieces of the cited prior art and used only Applicants’ specification as a guide to reconstruct the claimed invention. Neither Neutzler nor Hwang suggest the need to provide both an outer anticorrosive layer in combination with a diffusion/intermediate layer. Indeed, only Applicants have considered and conceived of a dual anticorrosive film (e.g., oxidation-resistant conductive film and diffusion/intermediate layer).

Furthermore, the diffusion/intermediate layer of Hwang is based on a *nickel-aluminum* layer rather than the TiN of Neutzler. Indeed, as described in the Background of the Invention section of Hwang, aluminum is disclosed as the anti-corrosive layer thereby evidencing that the anti-corrosion problems being solved by Hwang are unrelated to Neutzler (e.g., dissolving vs. oxidizing, etc.).

As mentioned above, the teachings of Hwang are unrelated to the device of Neutzler and there is no proper motivation, absent improper hindsight reasoning, to combine the teachings thereof. **In addition, turning to Neutzler, it is noted that the *single bipolar plate 8 separates two distinct MEA’s 4 and 6 so as to face the anode of one MEA and***

**cathode of the other (see col. 3, line 66 – col. 4, line 17). That is, Neutzler does not disclose two separator plates for the respective anode/cathode sides of a single MEA.**

This further evidences the distinction between Neutzler and Hwang.

Only Applicants considered and recognized the appropriate *combination* of elements necessary to achieve the disclosed results, and only Applicants provide the rationale/motivation as well as the enablement to realize those results. Examples of such results are described on page 4, line 16 – page 5, line 4; page 9, lines 23-25; page 10, lines 1-9; page 10, second paragraph – page 11, line 3; page 18, eleventh line from the bottom – page 19, line 9; and page 28, last line – page 29, line 4, etc., of Applicants' specification.

Turning to Neutzler, the disclosed bipolar plate is a clad plate comprising a substrate metal and an outer layer (coating) which are physically attached to each other so that a gap is present therebetween at the micro level. Because of the difference in the coefficient of linear expansion between the substrate metal and the outer layer, when a thermal shock is applied thereto, a stress occurs at the interface therebetween to create a gap over time, which reduces corrosion resistance. As a result, Neutzler is subject to problems which arise such as the increase of contact resistance between the MEA and the bipolar plate and the degradation of the performance of the polymer electrolyte due to metal ions resulting from corrosion.

Turning to Hwang, the separator plate is expressly disclosed *for a molten carbonate fuel cell*. There is no motivation/rationale/evidence from the prior art that the teachings related to a separator for a molten carbonate fuel cell can be attributed nor applied to a polymer electrolyte fuel cell, let alone affirmatively suggest doing so. Indeed, if the separator plate of Hwang is utilized in a polymer electrolyte fuel cell, the nickel film can not

maintain corrosion resistance so that contact resistance can not be reduced, thereby failing to provide sufficient performance as a separator plate. Further, the oxide film of aluminum can not reduce contact resistance, even further evidencing the lack of motivation to make the proposed combination.

Turning to the present invention, a diffused layer or intermediate layer can be present between a substrate metal plate and a conductive film so that the adhesion between the metal plate and the conductive film can be increased. As a result, the aforementioned problems encountered by Neutzler can be prevented. According to the present invention, a gap would not be created between each layer so that corrosion resistance can be maintained. As a result, it is possible to keep the contact resistance between the separator plate and other cell component low, and thus prevent the degradation of cell performance over time.

In view of all the foregoing, it is submitted that the proposed combination is improper because the Examiner has not provided the requisite *objective* evidence *from the prior art* that "suggests the desirability" of the proposed combination. As is well known in patent law, a *prima facie* showing of obviousness can only be established if the prior art "suggests the desirability" of the proposed combination using objective evidence. The Examiner is directed to MPEP § 2143.01 under the subsection entitled "Fact that References Can Be Combined or Modified is Not Sufficient to Establish *Prima Facie* Obviousness", which sets forth the applicable standard:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. (*In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990)).

In the instant case, even assuming *arguendo* that Neutzler can be modified by Hwang, it is submitted that the "mere fact that [Neutzler and Hwang] can be combined ... does not render

the resultant combination obvious" because nowhere does the prior art "suggest the desirability of the combination" as set forth by the Examiner.

The Examiner is further directed to MPEP § 2143.01 under the subsection entitled "Fact that the Claimed Invention is Within the Capabilities of One of Ordinary Skill in the Art is Not Sufficient by Itself to Establish *Prima Facie* Obviousness", which sets forth the applicable standard:

A statement that modifications of the prior art to meet the claimed invention would have been [obvious] because the references relied upon teach that all aspects of the claimed invention were *individually* known in the art is *not* sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. (citing *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993)).

In the instant case, even assuming *arguendo* that Neutzler and Hwang "teach that all aspects of the claimed invention [are] individually known in the art", it is submitted that such a conclusion "is not sufficient to establish a *prima facie* case of obviousness" because there is no *objective* reason on the record to combine the teachings of the cited prior art. In contrast, Neutzler and Hwang are completely silent as to suggesting the *combination* of using a diffused/intermediate layer with separator plates in the manner set forth in the claims.

At best, the Examiner has attempted to show only that the elements of the claimed invention are *individually* known without providing a *prima facie* showing of obviousness that the *combination* of elements recited in the claims is known or suggested in the art. For all the foregoing reasons, it is submitted that the proposed combination of Neutzler and Hwang is improper.

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v.*

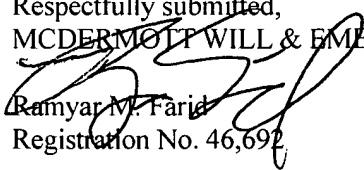
*Simplimatic Engineering Co.*, 819F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as the independent claims are patentable for the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also patentable. In addition, it is respectfully submitted that the dependent claims are patentable based on their own merits by adding novel and non-obvious features to the combination.

Based on the foregoing, it is submitted that the pending claims are patentable over the cited prior art. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103 be withdrawn.

### **CONCLUSION**

Having fully and completely responded to the Office Action, Applicants submit that all of the claims are now in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,  
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